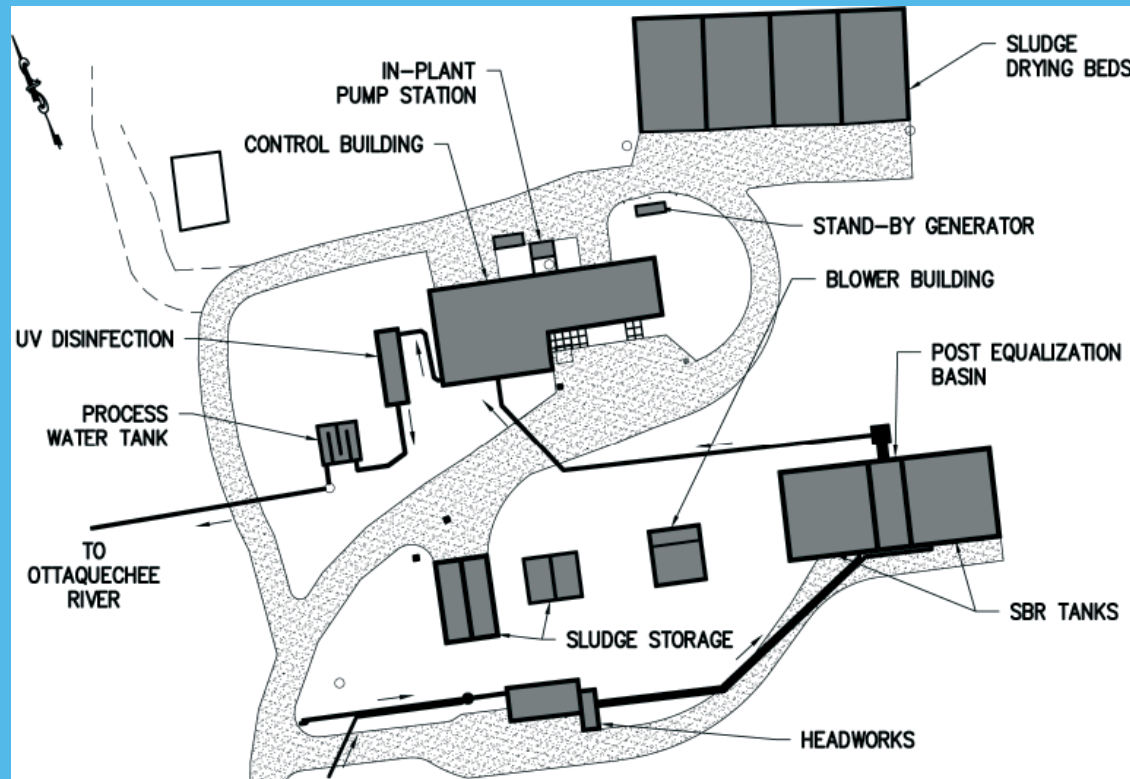


TOWN OF HARTFORD

Quechee WWTF Upgrade



Site Plan



2011



Project Team



Process Description

A majority of the wastewater collected in the Quechee service area flows to the Main pump station on Main Street, and is pumped in two 6" forcemains under the Ottaquechee River to the headworks at the treatment facility. At the headworks, influent wastewater goes through a screening process. The screening process removes inorganic materials and vortex grit removal system removes accumulated grit for disposal. From the headworks, wastewater flows by gravity to one of the two sequential batch reactor (SBR) tanks. Biological and secondary treatment is provided in the SBR tanks by aeration/mixing and settling. Treated flow from the SBR's enters a post equalization tank which provides downstream flow control. From the post EQ tank, treated wastewater is pumped to the tertiary filters. Cloth media filters provide a tertiary level of treatment for improved solids and phosphorus removal. From the filters, flow continues to the ultraviolet disinfection system which utilizes light to remove pathogens, and to an existing tank which provides storage for process water and effluent flow measurement. Treated flow is then discharged to the Ottaquechee River. Biosolids (sludge) generated from the SBR process are pumped to the sludge holding tanks. Aeration is provided for mixing and odor control. The sludge is thickened to a 2+% solids content before being pumped from the tanks to the sludge drying beds or hauled to the WRJ WWTF for dewatering.

Process Components

The Quechee WWTF was converted from an aerated lagoon facility with a permitted capacity of 300,000 gpd to an SBR facility with a permitted capacity of 475,000 gpd. The major process components are:

- Headworks: screening and grit removal system
- Sequential Batch Reactors (SBRs): biological treatment & clarification with biological phosphorus removal
- Post-equalization tank for flow control
- Cloth media filters for added solids and phosphorus removal (tertiary treatment)
- Open channel ultraviolet (UV) disinfection system (replaces chlorination)
- Sludge holding tanks (90,000 gallon capacity) with diffused aeration
- Programmable logic controller (PLC) to control and optimize treatment processes
- Supervisory Control and Data Acquisition (SCADA) system for remote monitoring of pump stations
- Process water system (uses effluent instead of potable water where applicable)
- Emergency power (entire WWTF will function during a power outage)
- Upgrades to wastewater pumping stations
- Sewer collection system rehabilitation to reduce infiltration



Project Funding

SRF Loan: \$5,890,000
 ARRA Grant: \$940,000
 Total Project Cost: \$6,830,000
 Bond Authorization: \$8,100,000



Project Highlights

The Quechee WWTF project was placed on a "fast track", when Hartford was awarded ARRA (stimulus) funds. The design was completed in less than nine months to meet a February 2010 deadline to award a construction contract. A local contractor, Trumbull-Nelson was awarded the contract in March 2010, their first wastewater treatment facility. T-N did an exceptional job completing the majority of construction in less than a year. The new treatment process went on-line in November 2010! The construction schedule was beat by more than six months and the project was delivered more than \$1M under budget!

Special thanks go to Gordon Bennett, Chief Operator and his staff for their patience during the construction.

UV Disinfection



Tertiary Filters



SBR Tank



Influent Screen



Grit Removal



Laboratory



Energy Efficiency & Sustainability

Energy efficiency and sustainability were major principles of design and construction. Some of the items incorporated into the project were as follows:

- Vortex grit removal system in the headworks uses minimal energy
- SBR system utilizes both aeration and mechanical mixers to optimize energy consumption
- Post Equalization allows for reduction of downstream equipment sizing
- Pumps and blowers with premium efficiency motors and variable frequency drives to reduce energy & improve process control
- UV disinfection with automatic control based on flows to reduce output and save energy
- Heat recovery in the Control Building ventilation system
- New R-40 roof and R-20 walls in the Control Building for reduced heating costs and cooling savings.
- Beneficial re-use of chlorine contact tank, blower building, control building and sludge storage tank
- PLC control system to optimize processes and improve process monitoring
- High efficiency boilers and hydronic heating system
- Direct digital controls for optimizing heating and cooling control to reduce energy consumption
- Water saving plumbing fixtures to reduce water usage
- High efficiency lighting with occupancy sensors and photocell control (exterior)
- Porous pavement for stormwater control (no net new impervious surface area)
- Process water system to reduce potable water consumption

